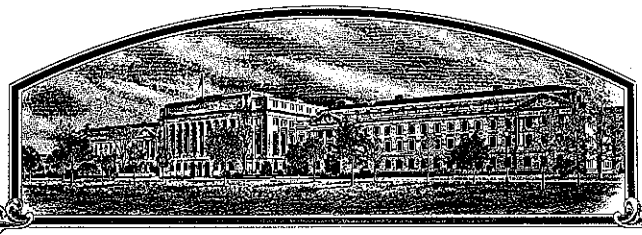

No. 9100165

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pioneer Hi-Bred International, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT TY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'2545'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D.C. *this* 31st *day of* March *in the year of our Lord one thousand nine hundred and* ninety-three.

Attest:

Kenneth K Evans

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

FORM APPROVED: OMB 0581-0055, Expires 1/31/91

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
Pioneer Hi-Bred International, Inc.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO.
WBA409B1

3. VARIETY NAME
2545

4. ADDRESS *(street and no. or R.F.D. no., city, state, and ZIP)*
Dept. of Wheat Breeding
R.R. 1 Box 297A
Windfall, IN 46076

5. PHONE *(Include area code)*
(317) 945-7906

FOR OFFICIAL USE ONLY

PVPO NUMBER
9100165

FILING Date: April 15, 1991
Time: ☑ A.M. ☐ P.M.

FEES RECEIVED Filing and Examination Fee: $2,150.00 Date: April 15, 1991
Certificate Fee: $250.00 Date: Feb. 22, 1993

6. GENUS AND SPECIES NAME
Triticum aestivum

7. FAMILY NAME *(Botanical)*
gramineae

8. CROP KIND NAME *(Common Name)*
Wheat

9. DATE OF DETERMINATION
August 1, 1989

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Corporation

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
Iowa

12. DATE OF INCORPORATION
May, 1926

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
Dr. Gregory C. Marshall
Pioneer Hi-Bred International, Inc.
R.R 1 Box 297A
Windfall, IN 46076
PHONE *(Include area code)*: (317) 945-7906

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow INSTRUCTIONS on reverse)*

a. ☑ Exhibit A, Origin and Breeding History of the Variety.
b. ☑ Exhibit B, Novelty Statement.
c. ☑ Exhibit C, Objective Description of Variety.
d. ☑ Exhibit D, Additional Description of Variety.
e. ☑ Exhibit E, Statement of the Basis of Applicant's Ownership.
f. ☑ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office 4/10/91.
g. ☑ Filing and Examination Fee ($2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See section 83(a) of the Plant Variety Protection Act.)*
☐ YES *(If "YES," answer items 16 and 17 below)* ☑ NO *(If "NO," skip to item 18 below)*

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
☐ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
☐ YES *(If "YES," through* ☐ Plant Variety Protection Act ☐ Patent Act. Give date: _____ .)
☑ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
☐ YES (If "YES," give names of countries and dates)
☑ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*	CAPACITY OR TITLE	DATE
Gregory C. Marshall	Coordinator of Soft Red Winter Wheat Breeding	4/10/91
SIGNATURE OF APPLICANT *(Owner(s))*	CAPACITY OR TITLE	DATE

14A. Exhibit A. Origin and Breeding History of Pioneer Wheat Cultivar 2545.

Pioneer cultivar 2545, Triticum aestivum L., em Thell., a soft red winter wheat was developed by Pioneer Hi-Bred International Inc., from the three way cross 'IL71-5662'/Pioneer line 'W9018A'//Pioneer line 'W689D-2'. IL71-5662 was an experimental soft red winter wheat from Illinois derived from the cross: 'VA66-54-10'/'Arthur'. Pioneer line W9018A was derived from the cross: Pioneer line 'W521'/'S76'. The parentage of Pioneer line W521 is one quarter CIMMYT spring wheat and three quarters soft red winter wheat although the specific parents are not known. S76 is a soft red winter wheat cultivar developed and released by Pioneer Hi-Bred International in 1976. Pioneer line W689D-2 is an F_7 generation selection from the bulk which became Pioneer cultivar '2550'. The detailed parentage of 2545 is: VA66-54-10/Arthur//W521/S76/3/W689D-2.

The single cross of IL71-5662/Pioneer line W9018A (designated 'WBZ941') was made in the fall greenhouse cycle of 1979 and the three way cross, WBZ941/W689D-2, made in the fall 1980 greenhouse cycle. The F_1, designated 'WBA409', was grown and harvested in the 1981 transplant nursery at Windfall, IN. The bulk F_2 seed was planted in the fall of 1981 at both Ft. Branch and Windfall, IN. Selection was done at Ft. Branch only due to ice damage in the plot at Windfall. Individual F_2 heads were selected, harvested and threshed to produce 190 F_3 headrows in the Windfall selection nursery. One selected row (THR664-27) also was chosen for the generation advance nursery. Four heads

14A. Exhibit A. (con't.)

were harvested from THR664-27, and F_4 seed planted in the greenhouse at Hutchinson, KS for generation advance. The F_5 generation was grown in the 1983 generation advance transplant nursery at Windfall and two rows were selected (entry 3683), both tracing to the same F_3 head. Four heads were harvested and individually threshed to plant the F_6 headrows. One row (FHR234-3) grown at Ft. Branch was cut and bulked for entry into a preliminary yield trial. After entry in the yield test program the line was designated WBA409B1. WBA409B1 has been tested for yield, agronomic traits, and milling and baking quality since 1985. In the F_8 generation, 100 heads were harvested from a small bulk increase and used to plant 100 purification headrows in the fall of 1987. Offtype rows were destroyed and 96 rows individually cut and threshed. Individual progeny plots (tracing to a single head) were planted in 1988 and offtype plots mowed prior to harvest. The remaining plots were cut in bulk and constitute breeder seed.

In the fall of 1989, WBA409B1 was given the designation YW591 and further seed increase turned over to Parent Cereal Seed. Following the 1990 harvest, YW591 was designated XW591.

2545 has shown uniformity and stability for all traits described in Exhibit C of this application.

9100165

PIONEER HI-BRED INTERNATIONAL, INC.
PLANT BREEDING DIVISION

DEPARTMENT OF CEREAL SEED BREEDING
R.R. #1 • BOX 297A
WINDFALL, INDIANA 46076
PHONE (317) 945-7906

PIONEER®

December 15, 1992

Alan A. Atchley, Plant Variety Examiner
Plant Variety Protection Office, AMS, USDA
NAL Building, Room 500
10301 Baltimore Blvd.
Beltsville, MD 20705-2351

Subject: PVP Application No. 9100165, Wheat variety '2545'

Dear Mr. Atchley:

In response to your letter dated December 10, 1992, regarding wheat variety '2545', I am providing you with the following information.

Exhibit A.

At the time of application, '2545' was observed to be uniform and stable since the seventh generation, or the last six generations.

Wheat variety '2545' was bred and selected at each generation for any or all of the following characteristics: winter hardiness, disease resistance, plant type, plant height, head type, straw strength, maturity, grain yield, test weight, and milling and baking qualities.

Exhibit D.

Regarding our use of a one to nine scale for rating disease reactions, this is a fairly common practice in plant breeding. In many breeding programs, this number scale may be directly related to percent infection (1=10%, 9=90%, etc.). Pioneer has a more complex system for rating that varies with the disease being rated. The primary objective is to establish a relative rank or differential of the varieties being tested. However, our one to nine scale can generally be described as follows:

9 = Resistant, no infection
8 = Resistant, trace infection
6 to 7 = Moderately resistant
4 to 5 = Moderately susceptible
2 to 3 = Susceptible
1 = Very susceptible

Please let me know if this information is not sufficient for you to conclude the examination of '2545'.

Sincerely,

Gregory C. Marshall

Dr. Gregory C. Marshall
Coordinator of Soft Winter Wheat Breeding

14B. Exhibit B. Novelty Statement.

2545 is most similar to Pioneer cultivar 2550. This would be expected since an F_7 selection from the bulk that became 2550 is genetically one-half of 2545. 2545 resembles 2550 in several characteristics, although there are several distinct differences between them. The grain yield of 2545 is about 11% higher than 2550 (Table 1). 2545 has slightly better resistance to straw lodging than 2550 (Table 1). 2545 has significantly better resistance to fungal leaf blights, powdery mildew, wheat soil borne and spindle streak mosaic virus than 2550. The plant height of 2545 is about 2 cm shorter than 2550. The head of 2545 is dense while 2550 is lax. The glume shoulder of 2545 is rounded while 2550 has oblique glume shoulders. The brush of 2545 is long and kernels average 4 mm in width while 2550 has a medium brush and kernels average 3 mm in width.

Cs19019

FORM APPROVED: OMB NO.0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
Pioneer Hi-Bred International, Inc.

ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*)
Dept. of Wheat Breeding
R.R. 1 Box 297A
Windfall, IN 46076

FOR OFFICIAL USE ONLY

PVPO NUMBER 9100165

VARIETY NAME OR TEMPORARY DESIGNATION
2545

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. KIND:
[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:
[2] 1 = SPRING 2 = WINTER 3 = OTHER (*Specify*) _____ [1] 1 = SOFT 2 = HARD 3 = OTHER (*Specify*) _____

[2] 1 = WHITE 2 = RED 3 = OTHER (*Specify*) _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:
[2][2][5] FIRST FLOWERING [2][3][2] LAST FLOWERING

4. MATURITY (*50% Flowering*):
[ ][ ] NO. OF DAYS *EARLIER* THAN ..... [ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS
[0][2] NO. OF DAYS *LATER* THAN ..... [1] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT (*From soil level to top of head*):
[0][9][3] CM. HIGH
[ ][ ] CM. TALLER THAN ..... [ ]
[0][6] CM. SHORTER THAN ..... [1] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (*See reverse*):
[2] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:
[1] 1 = YELLOW 2 = PURPLE

8. STEM:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[2] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT
[0][4] NO. OF NODES (*Originating from node above ground*)
[1] Waxy bloom: 1 = ABSENT 2 = PRESENT
[1] Internodes: 1 = HOLLOW 2 = SOLID
[2][3] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:
[1] Anthocyanin: 1 = ABSENT 2 = PRESENT
[2] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:
[1] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (*Specify*): _____
[2] Flag leaf: 1 = NOT TWISTED 2 = TWISTED
[1] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT
[1] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT
[1][2] MM. LEAF WIDTH (*First leaf below flag leaf*)
[2][1] CM. LEAF LENGTH (*First leaf below flag leaf*):

9100165

11. HEAD:

[2] Density: 1 = LAX 2 = DENSE

[1] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) _____

[3] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[2] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____

[0][8] CM. LENGTH [1][2] MM. WIDTH

12. GLUMES AT MATURITY:

[3] Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.)

[3] Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.)

[3] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[2] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

[1] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[1] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[2] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[1] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[3] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[4] Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

[0][7] MM. LENGTH [0][4] MM. WIDTH [3][4] GM. PER 1000 SEEDS

17. SEED CREASE:

[1] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[1] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[2] STEM RUST (Races) _____ [2] LEAF RUST (Races) _____ [0] STRIPE RUST (Races) _____ [0] LOOSE SMUT

[2] POWDERY MILDEW [0] BUNT [2] OTHER (Specify) Soilborne wheat mosaic virus Wheat spindle treak mosaic

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SAWFLY [0] APHID (Bydv.) [0] GREEN BUG [0] CEREAL LEAF BEETLE

[ ] OTHER (Specify) _____ HESSIAN FLY RACES: [0] GP [0] A [1] B [2] C [0] D [2] E [0] F [0] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	2550	Seed size	2550
Leaf size	2550	Seed shape	2550
Leaf color	2551	Coleoptile elongation	2550
Leaf carriage	2550	Seedling pigmentation	2550

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. (See attachment.)

7

14D. Exhibit D. Additional Description of Variety.

Pioneer cultivar 2545 is a common soft red winter wheat, Triticum aestivum L., em Thell..

The flowering date of 2545 is two days later than the cultivar Arthur and the same as Pioneer cultivar 2550. When seeded October 1 at Windfall, IN., the average first flowering of 2545 is May 19 or 225 days after emergence. Flowering is complete about seven days later.

2545 has averaged 94 cm in height (Table 1), about 6 cm shorter than Arthur and 2 cm shorter than 2550.

The plant color of 2545 at boot stage is green similar to Pioneer cultivar 2551. Anther color of 2545 is yellow.

Anthocyanin has not been noted in stems nor has a waxy bloom been noted. Internodes of 2545 are hollow and yellow at maturity. There are normally four internodes above ground and the average distance between the flag leaf node and the one below is 23 cm. Hairs are present on the last rachis internode.

The auricles of 2545 are free of anthocyanin but hairs are present.

The flag leaf of 2545 is erect and twisted at booting. The flag leaf minus one averages 12 mm in width and 21 cm in length. Waxy bloom is not present.

Spikes of 2545 are generally awnletted, dense, tapering, and yellow at maturity. Average spike length and width are 8 cm and

14D. Exhibit D. (con't.)

1.2 cm, respectively, although theses can vary with plant population and productivity level.

Glumes of 2545 are long, wide, and glaborous. The glume shoulder is rounded and the beak acute.

The coleoptile color is white and seedling anthocyanin absent. Juvenile plant growth is semi-erect.

Kernels of 2545 are red, ovate, and have rounded cheeks. The brush is long and is not collared. The kernel crease is narrow and shallow. Kernels average 7 mm in length, 4 mm in width and average 34 grams per thousand. Seed size can vary from year to year depending on environmental conditions. Phenol reaction is very dark brown similar to Pioneer cultivar 2550.

2545 is moderately resistant to prevalent races of leaf rust (Puccinia recondita f.sp. tritici) and stem rust (Puccinnia graminis f.sp. tritici) in the soft red winter wheat region (Table 1). Based on seedling tests with selected leaf and stem rust isolates, 2545 is postulated to possess Lr 3 and an unidentified Lr gene and Sr 10 and Sr 17. These tests were performed at the Plant Disease Clinic, University of Minnesota in conjunction with the USDA Cereal Rust Lab. 2545 has not been tested for resistance to specific races of stripe rust (Puccinia striiformis), bunt (Tilletia foetida and T. caries) or loose smut (Ustilago tritici). 2545 has exhibited resistance to powdery mildew (Erysiphe graminis f.sp. tritici) in the Corn Belt (Table 1). It has resistance to wheat soil borne mosaic and wheat

14D. Exhibit D. (con't.)

spindle streak virus (Table 1). It has shown moderate resistance to wheat streak mosaic virus (Table 1). 2545 has not been tested for tolerance to barley yellow dwarf virus.

2545 is resistant to biotype C of Hessian fly and susceptible to races B and E. It has not been tested for resistance to biotypes GP, A, D, F, or G. It has not been tested for resistance to sawfly, greenbug, or cereal leaf beetle. Hessian fly tests were conducted by the Small Grains Insect Pest Resistance Group, Dept. of Entomology, Purdue Univ., West Lafayette, IN.

2545 has a very good yield record when compared to current soft red winter wheat cultivars (Table 1). Short plant height coupled with strong straw provide 2545 with very good resistance to straw lodging. Good fungal leaf blight resistance and soil borne mosaic and spindle streak virus tolerance provide 2545 with good plant health.

The milling and baking properties of 2545 are acceptable and generally similar to most soft red winter wheat cultivars currently available.

Table 1. Performance of Pioneer cultivars 2545, 2550, 2551, and 2555 in yield trials grown in 1986-1990.

Trait	loc/exp	2545	2550	2551	2555
Grain yield (bu/a)	66	85.1	76.6**	76.9**	80.4*
Test Weight (lb/bu)	50	56.6	56.7	55.5**	56.5
Days to 50% flowering After Jan. 1.	16	139	139	139	138
Plant height (cm)	19	94	96	95	97
Lodging score	7	6.9+	6.3	7.1	6.9
Winterhardiness	4	7.5+	7.5	7.7	7.5
Leaf rust	8	5.5+	5.5	8.1**	7.0
Stem rust	2	6.5+	5.8	8.5**	5.8
Fungal leaf blight	7	5.3+	3.5*	2.6**	4.1
Powdery mildew	7	7.4+	5.4**	5.7**	5.4**
Spindle Streak Mosaic Virus	10	7.8+	7.3*	7.1	7.8
Soil Borne Mosaic@ Virus	4	9.0+	8.3	8.5	8.8
Wheat Streak Mosaic Virus	3	4.2+	3.2	4.7	4.2

Yield trials were grown in eastern Kansas, Missouri, Iowa, Illinois, Indiana, Ohio, Michigan, Pennsylvania, and Maryland.

+ Scale of 1-9 where 9 = resistant or excellent, 1 = susceptible or poor.

@ Data collected at the University of Illinois Soil Borne Mosaic Virus nursery.

*, ** Significantly different than 2545 at the 5% and 1% levels, respectively. Individual t-tests were calculated comparing the difference between 2545 and the selected cultivars. Significance depends on the range of the differences.

Loc/exp is an experiment grown at a location. Different experiments may have been grown at the same location.

//

Table 2. Quality test results of 2545, 2550, 2551, and 2555 from the Pioneer Wheat Quality Lab.

Year/Cultivar	Flour Yield %	Break Flour %	Flour Protein %	PSI %	AWRC %	Cookie Diameter cm
1986 (2 reps)						
2545	72.1	36.5	8.6	36.0	55.3	19.3
2550	70.2	34.0	8.9	32.8	57.5	18.9
2551	71.7	35.5	9.6**	32.5	57.	18.6
2555	73.7	38.3	8.6	35.6	53.3*	19.3
Caldwell	73.3	40.8	8.3*	36.6	55.0	19.2
Ave. Check	71.7	36.7	8.9	34.5	56.7	18.9
1987 (3 reps)						
2545	69.9	36.7	8.6	--	53.9	19.9
2550	70.3	37.7	8.8	--	54.0	19.7
2551	69.6	36.7	9.1	--	53.9	19.5
2555	72.2**	42.4*	8.7	--	52.7	19.7
Ave. Check	70.7	39.0	9.0	--	53.5	19.7
1988 (2 reps)						
2545	67.5	30.3	8.8	32.3	54.2	19.5
2550	67.6	30.8	9.1**	31.5	55.3	19.3
2551	67.5	30.3	10.0	32.3	54.8	18.7
2555	71.3*	36.6*	9.2	38.0	49.6	19.9
Ave.Check	68.8	32.6	9.5	32.4	53.3	19.3
1989 (2 reps)						
2545	70.4	35.3	7.3	--	54.8	20.2
2550	69.2	36.3	7.1	--	55.5	20.8
2551	70.5	35.4	8.0	--	54.0	19.7
2555	72.4*	41.1*	6.7	--	53.0	20.5
Ave. Check	70.3	37.3	7.1	--	54.6	20.1

Grain from yield trials grown at Ft. Branch and Windfall, IN, Ogden, IL, Blissfield, MI, and Napolean, OH was used for quality evaluation in the various years.

*, ** Significantly different than 2545 at the 5% and 1% levels respectively. Individual t-tests were calculated comparing the difference between 2545 and the selected cultivars. Significance depends on the range of the differences.

Average check equals the mean performance of selected check cultivars with known levels of performance for the various

quality characteristics. Cultivars used as checks include Caldwell, 2550, 2551, 2548, and 2555.

Methods: Milling - Brabender Quadromat Sr. mill.
Protein - Dickey-john GACIII NIR analyzer.
PSI - AB grinder, sieve shaker.
AWRC - micro method on milled flour.
Cookie diameter - Total diameter of two cookies.

14E. Exhibit E. Statement of the Basis of Applicant's Ownership

Pioneer Hi-bred International, Inc., Plant Breeding Division, believes it is the sole, original, and first breeder of the 2545 cultivar of soft red winter wheat for which it solicits a certification of protection.